PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

(PCT Article 36 and Rule 70)

Applicant's or agent's file reference P200201036 WO	FOR FURTHER ACTION	See Notification of Transmittal of International Preliminary Examination Report (Form PCT/IPEA/416)
International application No. PCT/EP 03/11230	International filing date *(day/month/year)* 09.10.2003	Priority date *(day/month/year)* 22.11.2002
International Patent Classification (IPC) or both national classification and IPC H04L25/06		
Applicant TELEFONAKTIEBOLAGET L M ERICSSON (PUBL) et al.		

1. This international preliminary examination report has been prepared by this International Preliminary Examining Authority and is transmitted to the applicant according to Article 36.

2. This REPORT consists of a total of 7 sheets, including this cover sheet.

   ☐ This report is also accompanied by ANNEXES, i.e. sheets of the description, claims and/or drawings which have been amended and are the basis for this report and/or sheets containing rectifications made before this Authority (see Rule 70.16 and Section 607 of the Administrative Instructions under the PCT).

   These annexes consist of a total of sheets.

3. This report contains indications relating to the following items:

   - I ☒ Basis of the opinion
   - II ☐ Priority
   - III ☐ Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
   - IV ☐ Lack of unity of invention
   - V ☒ Reasoned statement under Rule 66.2(a)(ii) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
   - VI ☐ Certain documents cited
   - VII ☐ Certain defects in the international application
   - VIII ☐ Certain observations on the international application

Date of submission of the demand	Date of completion of this report
08.05.2004	07.07.2004
Name and mailing address of the international preliminary examining authority: European Patent Office - P.B. 5818 Patentlaan 2 NL-2280 HV Rijswijk - Pays Bas Tel. +31 70 340 - 2040 Tx: 31 651 epo nl Fax: +31 70 340 - 3016	Authorized Officer Moreno, M Telephone No. +31 70 340-4414

INTERNATIONAL PRELIMINARY EXAMINATION REPORT

International application No. PCT/EP 03/11230

I. Basis of the report

1. With regard to the **elements** of the international application *(Replacement sheets which have been furnished to the receiving Office in response to an invitation under Article 14 are referred to in this report as "originally filed" and are not annexed to this report since they do not contain amendments (Rules 70.16 and 70.17))*:

Description, Pages

1-22 as originally filed

Claims, Numbers

1-27 as originally filed

Drawings, Sheets

1/4-4/4 as originally filed

2. With regard to the **language**, all the elements marked above were available or furnished to this Authority in the language in which the international application was filed, unless otherwise indicated under this item.

   These elements were available or furnished to this Authority in the following language: , which is:

   ☐ the language of a translation furnished for the purposes of the international search (under Rule 23.1(b)).

   ☐ the language of publication of the international application (under Rule 48.3(b)).

   ☐ the language of a translation furnished for the purposes of international preliminary examination (under Rule 55.2 and/or 55.3).

3. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application, the international preliminary examination was carried out on the basis of the sequence listing:

   ☐ contained in the international application in written form.

   ☐ filed together with the international application in computer readable form.

   ☐ furnished subsequently to this Authority in written form.

   ☐ furnished subsequently to this Authority in computer readable form.

   ☐ The statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.

   ☐ The statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

4. The amendments have resulted in the cancellation of:

   ☐ the description, pages:

   ☐ the claims, Nos.:

   ☐ the drawings, sheets:

5. ☐ This report has been established as if (some of) the amendments had not been made, since they have been considered to go beyond the disclosure as filed (Rule 70.2(c)).

   (Any replacement sheet containing such amendments must be referred to under item 1 and annexed to this report.)

6. Additional observations, if necessary:

V. Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	5,6,7,8,15,16,17,18
	No:	Claims	1,2,3,4,9,10,11,12,13,14,19-27
Inventive step (IS)	Yes:	Claims	7,17
	No:	Claims	1,2,3,4,5,6,8,9,10,11,12,13,14,15,16,18-27
Industrial applicability (IA)	Yes:	Claims	1-27
	No:	Claims	

2. Citations and explanations

   see separate sheet

Re Item V

Reasoned statement with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Reference is made to the following documents:

   D1: MIKI N ET AL: 'Multipath interference canceller using soft-decision replica combined with hybrid ARQ in W-CDMA forward link' IEEE 54TH VEHICULAR TECHNOLOGY CONFERENCE, 7 - 11 September 2001, pages 1922-1926 vol.3, XP002239064 Piscataway, NJ, USA, IEEE.

   D2: EP 1187340 A

2. The present application does not meet the criteria of Article 33(1) PCT, because the subject-matter of claims 1, 11 is not new in the sense of Article 33(2) PCT.

2.1. The document D1 discloses (the references in parentheses applying to this document):
A method of decoding a communication signal in a digital communication system, where the communications signal is modulated according to a modulation scheme including amplitude information (page 1924, column 2, table 1); the method comprising
- generating a likelihood value for a received communications signal (page 1923, column 2, paragraph 1);
- decoding the communications signal based on at least the generated likelihood value (figure 3);
- providing a reliability indication of the amplitude information conveyed by the received communications signal (page 1923, column 2, section B, paragraph 3); and
- that the step of generating the likelihood value further comprises generating the likelihood value on the basis of the provided reliability indication of the amplitude information (page 1923, column 2, section B, paragraph 3).

The subject-matter of claim 1 is therefore not new in the sense of Article 33(2) PCT and therefore not inventive Article 33(3) PCT.

2.2. Similar reasoning to that of point 2.1 applies to claim 11 which therefore also lacks novelty (Art. 33(2) PCT) and inventive step (Art. 33(3) PCT).

2.3. Dependent claims 2, 9, 10, 12, 19, 20, 22-27 do not contain any additional feature which, in combination with the features of any claim to which they refer, meet the requirements of the PCT with respect of novelty (see D1, page 1922, column 1, section I, lines 1-12; Fig 3).

Therefore, the subject-matter of those claims is not novel (Art. 33(2) PCT) and therefore not inventive (Art. 33(3) PCT).

3. The document D2 discloses (the references in parentheses applying to this document):
An arrangement for decoding a communications signal in a digital communication system, the arrangement comprising:
- processing means adapted to generate a likelihood value for a received communications signal (Figure 4);
- a decoder for decoding the communications signal based on at least the generated likelihood value (Figures 3 and 4; page 3, column 4, lines 11-18);
- means for providing a reliability indication of the amplitude information conveyed by the received communications signal (page 2, column 2, lines 26-30, 41-42);
- said processing means is further adapted to generate the likelihood value on the basis of the provided reliability indication of the amplitude information (page 3, column 4, lines 43-47);

It is noted that D2 is silence about the kind of modulation used, i.e. it does not say that the signal is modulated according to a modulation scheme that includes amplitude information.

However, in view of D2, the use of a signal modulated according to a modulation scheme including amplitude information does not involve an inventive step (Art. 33(3) PCT).

Furthermore, the apparatus for decoding disclosed in D2 is regarded as adapted to process and decode such signals and without any modification to enable it to be so used.
Therefore, D2 can even be considered as anticipating independent claim 11 (apparatus claim) and the corresponding method claim, independent claim 1, and consequently, the subject-matter of those claims is not new in the sense of Article 33(2) PCT.

3.1. Dependent claims 3, 4, 13, 14 and 21 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of novelty and inventive, the reasons being as follows:
The additional features of those claims are already anticipated in D2 (see page 3, column 4, lines 43-47; page 2, column 2, lines 26-35; Figures 3, 4 and 7).

Therefore, the subject-matter of those claims is not novel (Art. 33(2) PCT) and therefore not inventive (Art. 33(3) PCT).

4. Dependent claims 5, 6, 8, 15, 16 and 18 do not contain any features which, in combination with the features of any claim to which they refer, meet the requirements of the PCT in respect of inventive step, the reasons being as follows:

- D2 discloses an automatic gain control section that obtains the average level of a signal output from the A/D converter for a predetermined time period (column 2, lines 26-29).
The fact that this predetermined time period corresponds to a time slot for communicating a bit sequence, as it is claimed in claims 5 and 15, it is merely one of several straightforward possibilities from which the skilled person would select, without the exercise of inventive step.

- D2 discloses the fact that control data from the AGC is input to the Log likelihood calculating section in order to make a weighting, i.e. to adjust the final generated likelihood value (see D2, column 4, lines 43-47) so that the influence of noise is reduced (column 6, lines 30-41) during the calculation of path metrics.
The feature of adjusting said likelihood value of a bit to a value corresponding to higher uncertainty, e.g. the likelihood value may be set to zero, could be regarded as an obvious design possibility that the skilled person would select when knowing that the likelihood value is affected by amplitude distortions, so it is not reliable, and therefore it is desired that this value does not have an influence in the further processing.

Thus, the subject-matter of claims 6 and 16 does not involve an inventive step and does not satisfy the criterion set forth in Articles 33 (1) and (3) PCT.

- Regarding claims 8 and 18, the skilled person would self-evidently contemplate the rejection of those symbols that are considered as unreliable before the

decoding stage, when thinking to solve the problem of how to speed up the decoding process.

In so doing, the skilled person would have solved the objective problem and arrived at the solution of claims 8 or 18 without having made an inventive step (Art 33(3) PCT).

4.1. It can be concluded that the subject-matter of claims 5, 6, 8, 15, 16 and 18, although novel, is not inventive (Art. 33(3) PCT).

5. The combination of the features of dependent claim 7 (method) and 17 (arrangement) is neither known from, nor rendered obvious by, the available prior art.

Hence, the subject-matter of claims 7 and 17 is to be novel (Art. 33(2) PCT) and inventive (Art. 33(3) PCT).